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Impovement of Latex Quality Using Locally-Produced Organic Fertilizer from Sewage Sludges in a Rubber Processing

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ABSTRACT

Most rubber plants in Indonesia are cultivated in highly-weathered soils; therefore, their annual productions have been relatively low with low quality latex as well. Therefore, some measures must be taken. The aim of this reseach was to increase latex quality from a rubber plantation in low fertility soils using a locally-produced organic fertilizer (LOF). This research consisted of two steps: LOF production and a field fertilization experiment. The LOF was made mainly from wastes materials from a latex processing industry. The field study was to assess the effects of LOF additions enriched with two micronutrients, using a randomized complete block design with 6 LOF levels, 4 soil fertility levels, and 5 rubber trees in each block, resulting in 120 rubber trees. The LOF level were 0, 10, 20, 30, 40, and 50 kgtree^{-1}. The LOF contained 17.35% organic-C, 1.14% total N, 0.53 ppm available P, 1.21 cmol (+)kg^{-1} echangeable K, and was slightly alkaline (pH 8.0). The soil had low fertility i.e low total N and exchangeable bases (K, Na, and Mg), and very acid (pH 4,5). Variables of quality of latex comprising blockage index, ash-, impurity-, and dry latex-content were observed. Although there were no significant differences in most observed latex variables due to LOF addition, their values tended to be higher when the rubber trees were fertilized.

Keywords: latex, locally-produced organic fertilizer, rubber tree

INTRODUCTION

Rubber tree (*Hevea brasiliensis*) is one of most important and strategic agricultural commodities in Indonesia. Its major cultivation (83%) is house-hold farming, followed 9% by private plantation, and 8% state-owned plantation (Setyamidjaja, 1993; Siregar & Suhendry, 2013; Sampoerno, Khoiri, and Wulandari, 2015). As major producer, however, the average production of the house-hold farming is very low, 300-400 kg ha^{-1}, compared to the other two producers which have achieved 1500 kg ha^{-1} (Siswoputranto, 1981). Low productivity of the rubber tree under house-hold farmings is traditionally associated with a lack of input productions such as low fertilizer addition and tapping technology, culivated in fragile and steep sloping lands with infertile soil, and the use of low-yield species (Anonim, 1992; Siagian, 2011).

Currently Indonesia has been developing rubber tree clones with higher production from generation 1 to 4. The actual production of the generation 1 varies from 500 to 750 kg ha^{-1} yr^{-1}, the generation 2 from 1000 to 1500 kg ha^{-1} yr^{-1}, the generation 3 from 1500 to 2000 kg ha^{-1} yr^{-1}, and the generation 4 from 2000 – 2500 kg ha^{-1} yr^{-1} (Woelan et al., 2006). The rubber clone used in this experiment was from the generation 3, clone PR 261 (personal communication, 2016). Most rubber tree plantation in Indonesia are cultivated in low fertility soils with low of phosphorus, low in organic matter content, high acidity, and susceptible to erosion. Bengkulu province, for example, the rubber plantation is widely spread on Ultisols with high rainfall (>3000 mm yr^{-1}) and wide range of topography.

Several efforts have been developed to improve latex quality such as intensification, extensification, and rehabilitation. Intensification has been conducted through seed improvement and fertilizer addition. One of promosing efforts is addition of locally-made organic fertilizer (LOF). This organic fertilizer can be produced from waste materials from latex processing. A research conducted by Riwandi et al. (2016) reported this waste contained total organic-C 62.76%, total N 1.10%, total P 0.81%, and total K 0.24%. This waste, therefore, is potential materials for organic fertilizer production.

This research was aimed to improve latex production as well as its quality using organic fertilizer